HONORS ALGEBRA 2 **MIDTERM REVIEW PRACTICE** KEY

1. Solve and graph. $|3x-2|+4>11$

$-4 \quad -4$

$|3x-2|>7$

$3x-2>7$ or $3x-2<-7$

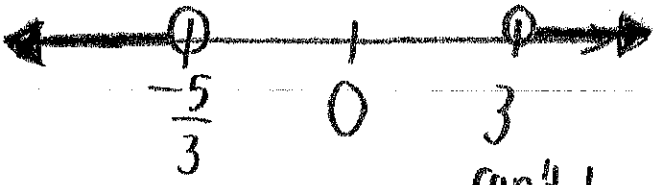
$+2 \quad +2 \qquad +2 \quad +2$

$\frac{3x}{3}>\frac{9}{3} \qquad \frac{3x}{3}<\frac{-5}{3}$

$x>3$ or $x<-\frac{5}{3}$

$(-\infty, -\frac{5}{3}) \cup (3, \infty)$

$x>3$ or $x<-\frac{5}{3}$



2. Find the domain and range over the set of real numbers. $f(x)=\sqrt{x-2}$

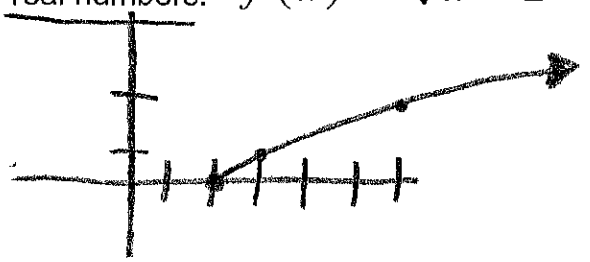
Can't take $\sqrt{}$ of neg # in $\mathbb{R}$

$x-2 \geq 0$

$x \geq 2$

Domain = $[2, \infty)$

Range = $[0, \infty)$



3. Write the equation of the line in slope-intercept form through the point $(-3,1)$ and **perpendicular to the line** $x+2y=8$.

$x+2y=8$

$-x \qquad -x$

$\frac{2y}{2}=\frac{-x+8}{2}$

$y=-\frac{1}{2}x+4$

$m=-\frac{1}{2}$

perpendicular to $x+2y=8$

$\perp$ slopes are opposite reciprocals

$m_{\perp}=\frac{2}{1}$ $(-3,1)$

$x \quad y$

$1=2 \cdot -3+b$

$1=-6+b$

$b=7$

$y=2x+7$

4. Solve the system of inequalities by graphing.

$x \leq 1$

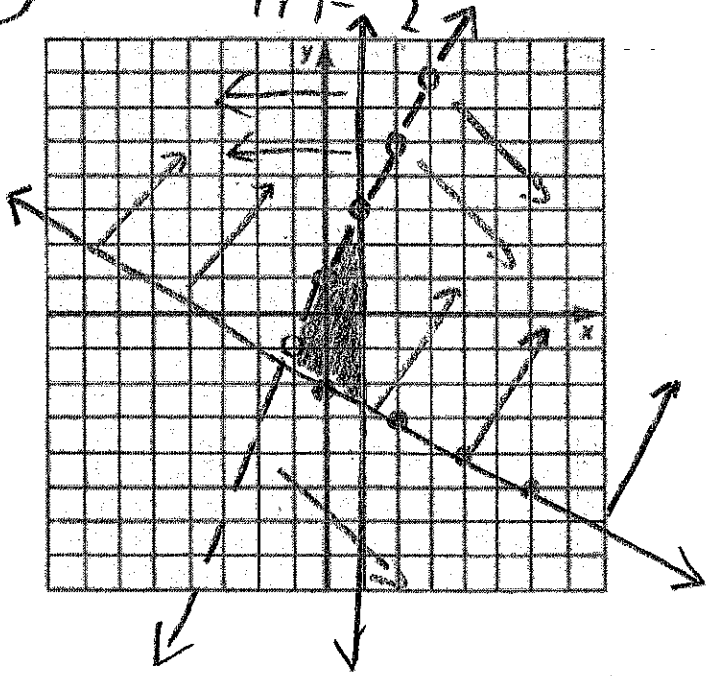
$y<2x+1$

$x+2y \geq -4$

$\frac{2y}{2} \geq \frac{-x-4}{2} \quad \frac{-4}{2}$

$y \geq -\frac{1}{2}x-2$

$m=-\frac{1}{2} \quad (0,-2)$



5. **Solve the system of equations by elimination.**

$5x + 2y = 4$

$-2(3x + 4y + 2z) = 6 \cdot -2$

$7x + 3y + 4z = 29$

eliminate z twice

$-6x - 8y - 4z = -12$

$7x + 3y + 4z = 29$

$x - 5y = 17$

$5x + 2y = 4$

$-5(x - 5y = 17) \cdot -5$

$5x + 2y = 4$

$-5x + 25y = -85$

$27y = -81$

$y = -3$

$5x + 2(-3) = 4$

$5x - 6 = 4$

$x = 2$

$3(2) + 4(-3) + 2z = 6$

$6 - 12 + 2z = 6$

$-6 + 2z = 6$

$2z = 12$

$z = 6$

$(2, -3, 6)$

6 – 8 **Factor each expression completely.**

6. $3x^2 - 10x - 8$ $-24x^2$

stretch method

$-12x, 2x$

$(3x^2 - 12x) + (2x - 8)$ grouping

$3x(x - 4) + 2(x - 4)$

$(x - 4)(3x + 2)$

7. $20x^4 - 45x^2$

GCF $= 5x^2$

$5x^2(4x^2 - 9)$

difference of squares

$5x^2(2x + 3)(2x - 3)$

8. $x^3 + 8$

Sum of Cubes!

$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$

$a = x \quad b = 2$

$(x + 2)(x^2 - 2x + 4)$

9. Evaluate the determinant using expansion by minors.

$$\begin{vmatrix} -2 & 7 & -2 \\ 4 & 5 & 2 \\ 1 & 0 & 1 \end{vmatrix} \qquad \begin{vmatrix} + & - & + \\ - & + & - \\ + & - & + \end{vmatrix}$$

row 3

$$1\begin{vmatrix} 7 & -2 \\ 5 & 2 \end{vmatrix} - 0 + -1\begin{vmatrix} -2 & 7 \\ 4 & 5 \end{vmatrix}$$

$1(14 - -10) + -1(-10 - 28)$

$1(24) + -1(-38) = 24 + 38 = 62$

10 – 12 **Simplify each expression**.

10. $\dfrac{(3x^2y^3)^3}{(5x^4y^2)^2}$

$\dfrac{27x^6y^9}{25x^8y^4}$

$\dfrac{27y^5}{25x^2}$

11. $\left(\dfrac{x}{y^{-3}}\right)^{-2}$

Flip negative exponents

$\dfrac{(x)^{-2}}{(y^{-3})^{-2}}$

$\dfrac{x^{-2}}{y^6} = \dfrac{1}{x^2y^6}$

Flip negative exponents!

12. $(3x^2+5y)(3x^2-5y)$

$9x^4 - 15xy + 15xy - 25y^2$

$9x^4 - 25y^2$

13 – 17 **Write in simplest radical form**.

13. $\sqrt{80x^5y^4}$

$\sqrt{16}\cdot\sqrt{5}$

$4x^2y^2\sqrt{5x}$

14. $\sqrt{\dfrac{5}{8x}}\cdot\dfrac{\sqrt{8x}}{\sqrt{8x}}$

$\dfrac{\sqrt{40x}}{8x} = \dfrac{\sqrt{4}\cdot\sqrt{10x}}{8x}$

$\dfrac{2\sqrt{10x}}{8x} = \dfrac{\sqrt{10x}}{4x}$

15. $\dfrac{5}{(7-\sqrt{3})}\cdot\dfrac{(7+\sqrt{3})}{(7+\sqrt{3})}$

Mult by conjugate

$\dfrac{35+5\sqrt{3}}{49-3}$

$\dfrac{35+5\sqrt{3}}{46}$

16. $\sqrt{-12}\bullet\sqrt{-5}$

$i\sqrt{12}\cdot i\sqrt{5}$

$i^2\sqrt{60}$

$-1\sqrt{60}$

$-1\sqrt{4}\cdot\sqrt{15}$

$-2\sqrt{15}$

17. $(5-2i\sqrt{3})(5+2i\sqrt{3})$

FOIL

$25+10i\sqrt{3}-10i\sqrt{3}-4i^2\sqrt{9}$

$25+4\cdot3$

$25+12=37$